The efforts made in the dissertation are to understand strongly continuous quantum dynamical semigroups(QDS) by yielding examples of Lindbladians which could generate Markov semigroups. Such semigroups come into picture when one studies the dynamics of open quantum systems. The QDS, which are non-commutative analogue of the expectation semigroup of Markov processes in the classical case, are the semigroups of completely positive maps on $C^*$-algebras or von Neumann algebras satisfying continuity conditions. The uniformly continuous QDS are completely characterized on hyperfinite von Neumann algebras by Lindblad and on $C^*$-algebras by Christensen, Evans by a bounded generator known as Lindbladian.

However, for the case of a strongly continuous QDS, structure of the generator is not well understood.

Davies, Kato, Chebotarev, Fagnola showed that under certain assumptions, unbounded generators have a similar Lindblad form. Conversely, in various attempts, given a Lindblad like unbounded operators, the QDS were generated but these QDS need not be Markov(Conservative).

Here, we study a class of Lindbladians expressed as bilinear forms on a GNS space of a UHF algebra. Using quantum stochastic dilations it was proved that the Hudson-Parthasarathy (HP) type quantum differential equation associated with Lindblad form exhibits unique unitary solution.

The QDS thus constructed by taking the vacuum expectation semigroup of the homomorphic co-cycle is conservative, therefore is the unique $C_0$-contraction semigroup associated with the given form.

Next, for a class of Lindbladians on UHF algebra, existence of associated Evans-Hudson flows was proved. The expectation semigroup associated with the given Lindbladian is Markov. The arguments used here to solve stochastic differential equations associated with the Lindbladian reveal that the local structure of the UHF algebra is immensely helpful.